



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT

PROJECT : 1X800MW TANGEDCO NORTH CHENNAI TPP **DATE:** - 27.12.2017
PACKAGE : AIR CONDITIONING SYSTEM
TENDER ENQUIRY NO.: PE/PG/NC3/E-5784/2017 dtd. 28.11.2017

Corrigendum-02

In reference to the above mentioned tender enquiry, please note the following:

1. Amendment-1 to the technical specification and revised PID of Air Conditioning System are enclosed herewith.
2. Revised price format Rev01 is also enclosed herewith.
3. Bidders are requested to submit your offer as per revised price format only.
4. Bidders who have submitted their offer are requested to submit the offer as per revised price format.

All other terms and conditions remain unchanged. Please arrange to submit offer by due date i.e. 06/01/2018, 10:00 AM.

For and on behalf of BHEL

UPENDRA CHAUDHARY
(DY.MGR/BOP Ordering/BHEL-PEM)



1x800 MW NORTH CHENNAI TPS
ANNEXURE – A: CHANGES TO THE TECHNICAL SPECIFICATION

SPECIFICATION NO.: PE-TS-423-553-A001
AIR CONDITIONING SYSTEM
REV. NO. 00 DATE: 22/12/2017
Page 1 of 2

The following changes with respect to Technical Specification for **Air Conditioning System** BHEL's Technical specification no **PE-TS-423-553-A001, R01** shall apply.
Bidders to note that existing clauses/details as appearing in the specification stands deleted and clauses/details as mentioned in "Modified to or Read as" column shall be applicable and complied by the bidder.

MODIFIED CLAUSES/PAGE NUMBERS.

Vol. No.	Section/Description	Clause no.	Page no	Existing clause/details	Modified to or Read as
IIB	SECTION– C1A, SPECIFIC TECHNICAL REQUIREMENT	3.1	20 OF 721	DBT (°C): Summer: 39.4 Deg. C	DBT (°C): Summer: 47 Deg. C
	SECTION– I, C4 TECHNICAL REQUIREMENT (C&I)	VIII	445 of 721	Open and Close limit switch feed backs of valves are to be connected to DDCMIS for remote viewing and for interlocks and protection.	Open and Close limit switch feed backs of valves are to be connected to DDCMIS for remote viewing and for interlocks and protection. In addition to above limit switches for all critical valves such as manual valve located after motorised valve in chiller, pump and cooling tower shall be provided.
	SECTION– C2A, CUSTOMER SPECIFICATION TECHNICAL REQUIREMENT	2.1.10.3	35 of 721	Motor operated valves shall be provided as per System requirement for chilling machines, pumps, cooling towers in order to facilitate remote operation of entire air- conditioning plant and to select standby unit.	Motor operated valves shall be provided as per System requirement for chilling machines, pumps, cooling towers in order to facilitate remote operation of entire air- conditioning plant and to select standby unit. Motorized Valves shall have manual override option for manual operation in the event of non-functioning of Motorized Valves. Spectacle blind to be provided at the inlet flange of motorized valve. In addition, motorized valve at condenser line of each

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1x800 MW NORTH CHENNAI TPS
ANNEXURE – A: CHANGES TO THE TECHNICAL SPECIFICATION

SPECIFICATION NO.: PE-TS-423-553-A001

AIR CONDITIONING SYSTEM

REV. NO. 00

DATE: 22/12/2017

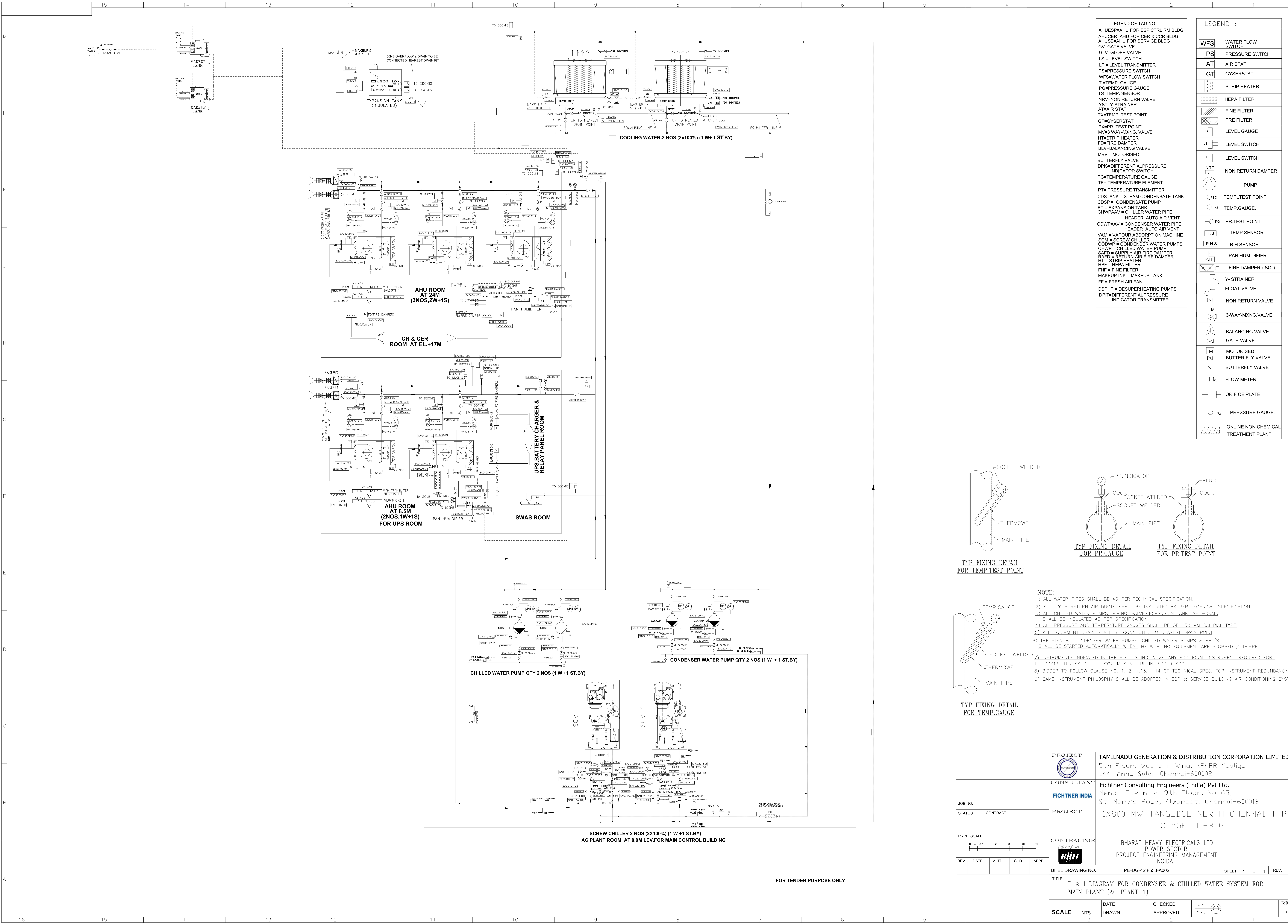
Page 2 of 2

					Package AC supplied in Service Building to be provided for facilitating remote selection of standby units. Apparatus dew point of package unit shall be min. 52 deg. F or as per system requirement. Package AC to be selected accordingly.
	P&ID FOR AC System		720 OF 721		Instruments indicated in the P&ID is indicative. Any additional instrument required for the completeness of the system shall be in bidder scope. Further, bidder to follow clause no. 1.12, 1.13, 1.14 for Instrument Redundancy.
	P&ID FOR AC System		720 OF 721		Revised P&ID for Air Conditioning System is enclosed.
TECHNICAL SPECIFICATION SUGGESTIVE PRICE FORMAT, REV. 01				1. Annexure – I: S. No. C1(b): 20TR AC quantity shall be 32 Nos 2. Annexure – I: S. No. C2: Fibreglass reinforced plastic (FRP) construction cooling towers of adequate capacity, complete with fan, motor, FRP basin, nozzles, make-up water & quick fill water connection, drains, piping, valves, strainers, ladder & all accessories as specified (Minimum 400 TR) 3. Annexure – I: S. No. E1, E1a (15 TR net capacity- 2 Nos), E1b (20 TR net capacity- 2 Nos) - Air Cooled Package AC 4. Annexure – I: S. No. E3, E3a (20 TR net capacity- 2 Nos), E3b (15 TR net capacity- 2 Nos) – Water Cooled Precision AC	1. Annexure – I: S. No. C1(b): 20TR AC quantity shall be 40 Nos 2. Annexure – I: S. No. C2: Fibreglass reinforced plastic (FRP) construction cooling towers of adequate capacity, complete with fan, motor, FRP basin, nozzles, make-up water & quick fill water connection, drains, piping, valves, strainers, ladder & all accessories as specified (Minimum 650 TR) 3. Annexure – I: S. No. E1, E1a, E1b: Requirement under above clause stands deleted. 4. Annexure – I: S. No. E3, E3a, E3b - Requirement under above clause stands deleted.

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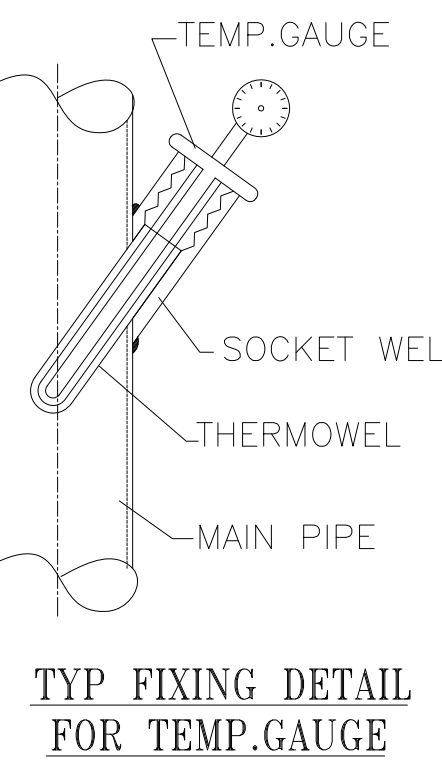
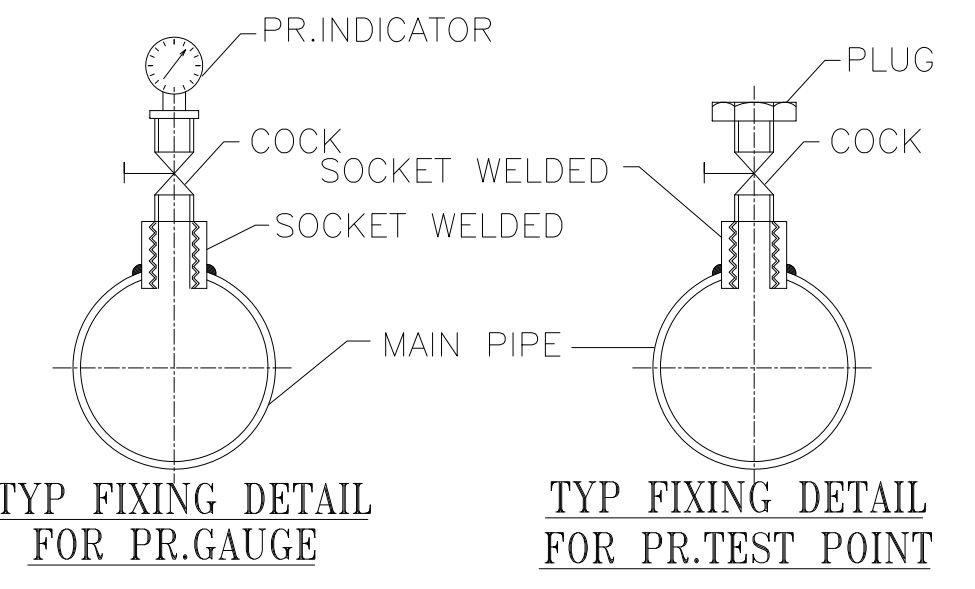
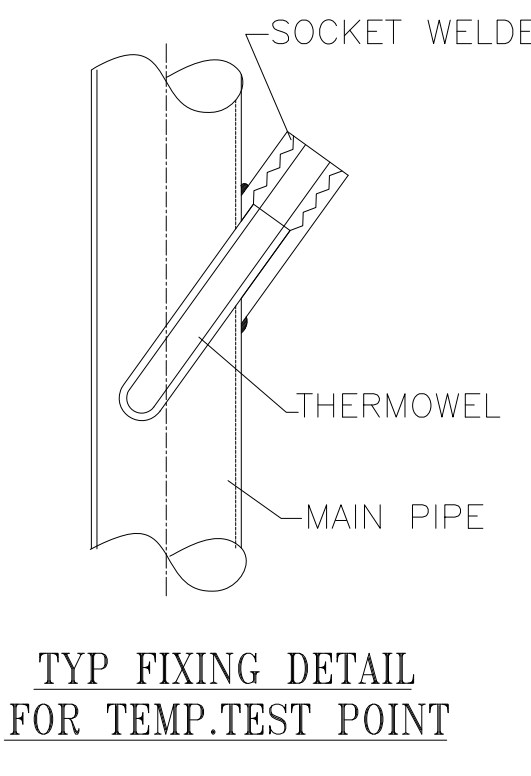
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LEGEND OF TAG NO.
AHUESP=AHU FOR ESP CTRL RM BLDG
AHUCER=AHU FOR CER & CCR BLDG
AHUSB=AHU FOR SERVICE BLDG
GV=GATE VALVE
QV=GLOBE VALVE
LS=LEVEL SWITCH
LT=LEVEL TRANSMITTER
PS=PRESSURE SWITCH
PG=PRESSURE GAUGE
TS=TEMP. SENSOR
NRV=NON RETURN VALVE
YST=Y-STRAINER
AT=AIR STAT
TX=TEMP. TEST POINT
GT=GYSERSTAT
PX=PR. TEST POINT
MV=3 WAY-MXNG. VALVE
HT=STRIP HEATER
FD=FIRE DAMPER
BLV=BALANCING VALVE
MBV = MOTORISED BUTTERFLY VALVE
DPIS=DIFFERENTIAL PRESSURE INDICATOR SWITCH
TG=TEMPERATURE GAUGE
TE= TEMPERATURE ELEMENT
CDSTANK = STEAM CONDENSATE TANK
CDSP = CONDENSATE PUMP
ET = EXPANSION TANK
CHWPAV = CHILLER WATER PIPE
HEADER AUTO AIR VENT
COWPAV = CONDENSER WATER PIPE
HEADER AUTO AIR VENT
VAM = VAPOUR ABSORPTION MACHINE
SCM = SCREW CHILLER
COWP = CONDENSER WATER PUMPS
CHWP = CHILLED WATER PUMP
SAFD = SUPPLY AIR FIRE DAMPER
RAFD = RETURN AIR FIRE DAMPER
HT = STRIP HEATER
HFF = HEPA FILTER
FNF = FINE FILTER
MAKEUPTNK = MAKEUP TANK
FF = FRESH AIR FAN
DSPHP = DESUPERHEATING PUMPS
DPIT=DIFFERENTIAL PRESSURE INDICATOR TRANSMITTER

LEGEND :-	
	WATER FLOW SWITCH
	PRESSURE SWITCH
	AIR STAT
	GYSERSTAT
	STRIP HEATER
	HEPA FILTER
	FINE FILTER
	PRE FILTER
	LEVEL GAUGE
	LEVEL SWITCH
	LEVEL SWITCH
	NON RETURN DAMPER
	TEMP..TEST POINT
	TEMP.GAUGE.
	PR.TEST POINT
	TEMP.SENSOR
	R.H.SENSOR
	PAN HUMIDIFIER
	FIRE DAMPER (SOL)
	Y- STRAINER
	FLOAT VALVE
	NON RETURN VALVE
	3-WAY-MXNG.VALVE
	BALANCING VALVE
	GATE VALVE
	MOTORISED BUTTER FLY VALVE
	BUTTERFLY VALVE
	FLOW METER
	ORIFICE PLATE
	PRESSURE GAUGE.
	ONLINE NON CHEMICAL TREATMENT PLANT



NOTE:
1) ALL WATER PIPES SHALL BE AS PER TECHNICAL SPECIFICATION.
2) SUPPLY & RETURN AIR DUCTS SHALL BE INSULATED AS PER TECHNICAL SPECIFICATION.
3) ALL CHILLED WATER PUMPS, PIPING, VALVES, EXPANSION TANK, AHU-DRAIN SHALL BE INSULATED AS PER SPECIFICATION.
4) ALL PRESSURE AND TEMPERATURE GAUGES SHALL BE OF 150 MM DIA DIAL TYPE.
5) ALL EQUIPMENT DRAIN SHALL BE CONNECTED TO NEAREST DRAIN POINT
6) THE STANDBY CONDENSER WATER PUMPS, CHILLED WATER PUMPS & AHU'S SHALL BE STARTED AUTOMATICALLY WHEN THE WORKING EQUIPMENT ARE STOPPED / TRIPPED.
7) INSTRUMENTS INDICATED IN THE P&ID IS INDICATIVE. ANY ADDITIONAL INSTRUMENT REQUIRED FOR THE COMPLETENESS OF THE SYSTEM SHALL BE IN BIDDER SCOPE.
8) BIDDER TO FOLLOW CLAUSE NO. 1.12, 1.13, 1.14 OF TECHNICAL SPEC. FOR INSTRUMENT REDUNDANCY.
9) SAME INSTRUMENT PHILOSOPHY SHALL BE ADOPTED IN ESP & SERVICE BUILDING AIR CONDITIONING SYSTEM

PROJECT		TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED	
CONSULTANT		Fichtner Consulting Engineers (India) Pvt Ltd.	
PROJECT		1X800 MW TANGEDCO NORTH CHENNAI TPP	
CONTRACTOR		BHARAT HEAVY ELECTRICALS LTD	
BHEL DRAWING NO.		PE-DG-423-553-A002	
TITLE		P & I DIAGRAM FOR CONDENSER & CHILLED WATER SYSTEM FOR MAIN PLANT (AC PLANT-1)	
DATE		CHECKED	
SCALE		APPROVED	
SHEET 1 OF 1		REV. 01	

PRICE FORMAT REV01 ANNEXURE - I							
NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP				
NAME OF PACKAGE:			AIR CONDITIONING SYSTEM				
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017				
SL NO	DESCRIPTION	UNIT	Qty	SUPPLY		ERECTION AND COMMISSIONING	
				Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
A	AC-Plant-1: CENTRAL CHILLED WATER SYSTEM FOR MAIN CCR AREAS						
1	Microprocessor controlled, water cooled chiller package each of minimum capacity 180 TR (ACTUAL) consisting of Hermetic/ semi - Hermetically sealed Screw type refrigerant compressor operating on R134a refrigerant complete with motor, unit mounted starter, complete with suction and discharge shut off valves, HP / LP cutouts, oil pressure failure switch, gauge panel, automatic capacity control; Condenser, relief valve, chiller, controls such as thermostatic/electronic expansion valve, cooling thermostat, antifreeze thermostat, water flow switch, integral refrigerant pipes & fittings, strainer, sight glass, isolating valves, chiller drain valve, chiller insulation, refrigerant piping insulation, first charge of gas and oil, base frames, vibration isolators, integral wiring, unit mounted isolator / fuse switch and other accessories as specified.	2	NO				
2	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, VFD, drive set , filters (pre filter at the inlet), 3 way motorised mixing valve with thermostatic controls and other accessories as per specifications to meet the AC load of the main Control Room areas of power house building at 17.0m and kept at 24.0 M floor level as per specification. Fine filter and HEPA Filters shall be provided as per the specification. Each AHU fan shall be provided with VFD driven motor alongwith VFD and other accessories as required for VFD shall also be included in the price.	3	NO				
3	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, VFD, drive set , filters (pre filter at the inlet), 3 way motorised mixing valve with thermostatic controls and other accessories as per specifications to meet the AC load of the UPS & Battery charger areas at 8.5m. Fine filter and HEPA Filters shall be provided as per the specification. Each AHU fan shall be provided with VFD driven motor alongwith VFD and other accessories as required for VFD shall also be included in the price.	2	NO				
4	Fibreglass reinforced plastic (FRP) construction cooling towers of adequate capacity, complete with fan, motor, FRP basin, nozzles, make-up water & quick fill water connection, drains, piping, valves, strainers, ladder & all accessories as specified.	2	NO				
5	Centrifugal pump sets for condenser water recirculation complete with TEFC motor & all accessories as specified.	2	NO				
6	Centrifugal pump sets for chilled water recirculation complete with TEFC motor & all accessories, as specified.	2	NO				
7	Make up water cum storage tank, for cooling towers Make up, of HDPE/MS (spray galvanised from inside) with accessories as required. Capacity of each tank 8 m3 .	2	NO				
8	Expansion Tank HDPE/MS (spray galvanised from inside) (insulated) for chilled water with all accessories as required, capacity 1 m3.	1	NO				
9	Online Non chemical scale preventer, with all accessories as required to meet system requirements	1	NO				
10	Condenser water piping with necessary fittings, strainers, valves including piping from make up water storage tank to humidifiers of AHU room as per specification. This shall include make up water piping with valves and fitting from terminal point upto the make up water tank.	1	LOT				
11	Insulated chilled water piping from AC plant to AHU rooms within power house building complete with valves supports, fittings, strainers, insulation with finish as per specification.	1	LOT				
12	Monsoon reheating/ winter heating kit comprising strip heaters, safety controls, air-stat, contactors, frame work, thermostat & humidistat/ sensors etc.	1	LOT				

PRICE FORMAT REV01 ANNEXURE - I							
NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP				
NAME OF PACKAGE:			AIR CONDITIONING SYSTEM				
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017				
SL NO	DESCRIPTION	UNIT	Qty	SUPPLY		ERECTION AND COMMISSIONING	
				Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
13	Pan type humidifier for each AHU room.	1	LOT				
14	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters as per the specification, dampers etc.	1	LOT				
B	AC Plant - 2 (ESP building)						
1	DX type, water cooled condensing unit of 40 TR (ACTUAL) capacity. The refrigerant compressor shall be Srew / Scroll, Open / Semi-hermetic type suitable for Refrigerant R-134a / R-407c / R-410a environment friendly HFC refrigerants with drive package (for open type compressor only), Suction and discharge valves, capacity control system, expansion valve, crank case heater etc. A control panel shall be provided to house all gauges and controls. The panel shall contain all necessary terminal strips to facilitate external wiring. The unit shall be complete with expansion valve, all necessary fittings, accessories, insulated refrigerent piping to and from AHUs, foundation bolts, nuts, washers etc complete in all respect.	2	NOs				
2	Sheet metal cabinet type air handling units (double skin as per specification) The draw through horizontal AHUs shall comprise of , Dampers, Filters (pre filter at the inlet), DX- cooling coil, Electric heating coil, Electric steam humidifier and Fan section with fan & TEFC sq cage induction motor, VFD, drive set, face and bypass damper with modulating motor, condensate drain pan, thermostatic controls and other accessories to meet the AC load of control room area. Fine filter and HEPA Filters shall be provided as per the specification. Each AHU fan shall be provided with VFD driven motor alongwith VFD and other accessories as required for VFD shall also be included in the price.	2	NOs				
3	Fibreglass reinforced plastic (FRP) construction cooling towers of adequate capacity, complete with fan, motor, FRP basin, nozzles, make-up water & quick fill water connection, drains, piping, valves, strainers, ladder & all accessories as specified.	2	NOs				
4	Centrifugal pump sets for condenser water recirculation complete with TEFC motor & all accessories as specified.	2	NOs				
5	Make up cum Storage water tank HDPE/MS (spray galvanised from inside) to cooling towers with accessories as required. Capacity of each tank 8 m3 .	1	NOs				
6	Online non - chemical scale preventer, with all accessories as required to meet system requirements	1	NOs				
7	Condenser water piping with necessary fittings, strainers, valves including piping from make up water storage tank to humidifiers of AHU room as per specification. This shall include make up water piping with valves and fitting from terminal point upto the make up water tank.	1	LOT				
8	Monsoon reheating/ winter heating kit comprising strip heaters, safety controls, air-stat, contactors, frame work, thermostat & humidistat/ sensors etc.	1	LOT				
9	Pan type humidifier for each AHU room.	1	LOT				
10	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc.	1	LOT				
C	AC Plant -3 : WATER COOLED PACKAGE UNIT (Service building building)						
1	Water Cooled PAC-Unit complete with all accessories as specified The package unit shall be complete with all accessories like duct heaters, pan humidifier, filters, acoustic insulation of duct for 5m from PU, drain piping with insulation upto nearest drain, required instrumentation etc						
a*	15 TR net capacity	8	NOs				
b*	20 TR net capacity	40	NOs				
2	Fibreglass reinforced plastic (FRP) construction cooling towers of adequate capacity, complete with fan, motor, FRP basin, nozzles, make-up water & quick fill water connection, drains, piping, valves, strainers, ladder & all accessories as specified (Minimum 450 TR)	2	NOs				
3	Centrifugal pump sets for condenser water recirculation complete with TEFC motor & all accessories as specified.	2	NOs				

PRICE FORMAT REV01 ANNEXURE - I							
NAME OF PROJECT:				1x800 TANGEDCO NORTH CHENNAI TPP			
NAME OF PACKAGE:				AIR CONDITIONING SYSTEM			
TENDER ENQUIRY No:				PE/PG/NC3/E-5784/2017			
SL NO	DESCRIPTION	UNIT	Qty	SUPPLY		ERECTION AND COMMISSIONING	
				Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
4	Make up water cum storage tank, for cooling towers Make up, of HDPE/MS (spray galvanised from inside) with accessories as required. Capacity of each tank 8 m3 .	2	NOs				
5	Online non - chemical scale preventer, with all accessories as required to meet system requirements	1	NOs				
6	Condenser water piping with necessary fittings, strainers, valves including piping from make up water storage tank to humidifiers of AHU room as per specification. This shall include make up water piping with valves and fitting from terminal point upto the make up water tank.	1	LOT				
7	Monsoon reheating/ winter heating kit comprising strip heaters, safety controls, air-stat, contactors, frame work, thermostat & humidistat/ sensors etc.	1	LOT				
8	Pan type humidifier for each AHU room.	1	LOT				
9	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc.	1	LOT				
D	ITEMS COMMON TO ALL AC PLANTS						
1*	Fan coil unit (FCU) consisting of chilled water cooling coil, blower, motor, drive set, filters (pre filter), 3 way motorised mixing valve with thermostatic controls and other accessories. All accessories like vibration isolation pads, hanger rods, supporting arrangement, canvass connection, nuts, bolts, washers and other items required to make the installation complete in all respect shall be supplied in adequate quantity along with the FCUs.						
a*	3 TR	5	NO*				
b*	2 TR	1	NO*				
c*	1.5 TR	1	NO*				
2*	Fire damper.						
a*	Fire damper with auto resetting, limit switches, indication lamps etc.	30	SQM*				
b*	Motorized actuator with single phase power supply for the above fire damper.	40	NO*				
3*	GSS zinc coating 275 gms/ m ² ducting complete with hangers/ supports, dampers, grilles, diffusers (with & without VCD) etc.						
a*	18G.	500	SQM*				
b*	20G.	1500	SQM*				
c*	22G.	2000	SQM*				
d*	24G.	2500	SQM*				
e*	Supply air diffuser with VCD (Extruded Aluminium).	55	SQM*				
f*	Return air diffuser without VCD (Extruded Aluminium).	90	SQM*				
g*	VOLUME CONTROL DAMPERS in GI construction as per specifications complete with fixing arrangement.	20	SQM*				
4	Acoustic insulation of the first 6 of ducting from AHU outlets.	1	LOT				
4.1*	Acoustic lining AHU / PU room as per specifications.	2000	SQM*				
5*	Thermal insulation of supply air duct & return air duct with finish as specified.	6500	SQM*				
6	Cable tray, conduits, junction box, Local control panel and Field instruments like pressure gauge, temperature gauge, temperature and pressure transmitters, DP transmitters, flow transmitters, flow indicator, etc. as required for the complete system	1	LOT				
7	Fiber optic cable	400	Rmt*				
8*	Insulated MS medium class drain piping upto nearest drain point with and without insulation						
a*	50mm	400	M				
b*	40mm	250	M				
E	Air conditioning system for aux control rooms as specified.						
1*	VOID						
2*	Air-cooled split type AC units consisting of condensing unit & evaporating unit including refrigerant pipes & fittings with insulation etc. (Minimum BEE Rating 5 Star for non ductable units).						
(a)*	5.0 TR capacity (ductable type, 415 V, 3 phase with isolation switch).	2	NO*				
(b)*	2.0 TR capacity (non-ductable type, 240 V, 1 phase) with isolation switch , i.e MCB of suitable rating as specified, voltage stabilizer, cabling, all supporting structure and refrigerent piping to suite actual site condition, drain piping upto nearest drain etc.	35	NO*				

PRICE FORMAT REV01 ANNEXURE - I							
NAME OF PROJECT:				1x800 TANGEDCO NORTH CHENNAI TPP			
NAME OF PACKAGE:				AIR CONDITIONING SYSTEM			
TENDER ENQUIRY No:				PE/PG/NC3/E-5784/2017			
SL NO	DESCRIPTION	UNIT	Qty	SUPPLY		ERECTION AND COMMISSIONING	
				Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
(c)*	1.5 TR capacity (non-ductable type, 240 V, 1 phase) with isolation switch , i.e MCB of suitable rating as specified, voltage stabilizer, cabling, all supporting structure and refrigerent piping to suite actual site condition, drain piping upto nearest drain etc..	25	NO*				
3*	VOID						
F*	Handling arrangement as per specification						
a*	Electric Hoist with traveling trolley of 3T capacity	1	No*				
b*	Manual trolley (Manually operated, platform trolley of 1.5 Ton capacity	2	No*				
c*	1T Chain pulley block	2	No*				
d*	1T Chain pulley block with travelling trolley	2	No*				
G*	Venetian blinds	100	SQM*				
H*	Air curtain along with instruments as per the specification. (for minimum door height 3 m and width 3 feet)	2	No*				
I	Total lumpsum price for special tools & tackles for maintenance inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up as per appendix-A).	1	LOT			NA	
J	Total lumpsum price for commissioning spares inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up as per appendix-B).	1	LOT			NA	
NOTES							
1	The bidder shall furnish unit rates for variable item (marked *) for necessary adjustment (plus or minus) variation during detailed engg. stage. The unit rates quoted above shall be considered and no separate unit rates shall be quoted. Unit rates shall be valid throughout the contract.						
2	Any other item not indicated above, but required to make the system complete in all respects, as per the technical specification, shall be supplied without any cost implication to BHEL.						
Particulars of bidder / authorised representative							
	Name	Designation	Signature	Date	Company Seal		

PRICE FORMAT REV01
APPENDIX - A
Special tools & tackles for maintenance

NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP			
NAME OF PACKAGE:			AIR CONDITIONING SYSTEM			
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017			
SL NO	DESCRIPTION	UNIT	Qty	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed	
1	FLAT D WRENCH - 6 MM TO 32 MM (12 Pcs)	SET	1			
2	BOX WRENCHES - 6 MM TO 22 MM (14 Pcs)	SET	1			
3	RING SPANNER - 6 MM TO 32 MM (12 Pcs)	SET	1			
4	ALLEN KEYS - 2 MM TO 10 MM	SET	1			
5	CRESCENT SCREW SPANNER	NO.	1			
6	SCREW DRIVER	NO.	1			
7	OFFSET SCREW DRIVER	NO.	1			
8	INSULATED PLIER	NO.	1			
9	TORCH LIGHT (SUITABLE FOR 2 CELL)	NO.	1			
10	HAMMER 1 LB	NO.	1			
11	OIL CAN	NO.	1			
12	POCKET THERMOMETER - 0 TO 50 DEG. C	NO.	1			
13	INSULATION TAPE ROLL	NO.	1			
14	STEEL FOOT RULE - 12"	NO.	1			
15	FEELER GAUGE 9 BLADES	NO.	1			
16	PIPE WRENCH	NO.	1			
17	FLARE NUT (1/4")	NOS.	6			
18	FLARING TOOL	NO.	1			
19	TUBE CUTTER	NO.	1			
20	GAS CHARGING PIPE	NO.	1			
21	NITROGEN CHARGING ADAPTER	NO.	1			
22	PRESSURE GAUGE (2 1/2" DIA DIAL) 0 - 300 PSI	NO.	1			
23	PRESSURE GAUGE (2 1/2" DIA DIAL) 0 - 500 PSI	NO.	1			
24	COMPOUND GAUGE (2 1/2" DIA DIAL) (-)300to 150 PSI	NO.	1			
25	PSYCHRO METER	NO.	1			
26	LOCK WITH KEY FOR TOOL BOX	NO.	1			
27	RATCHET 1/4"	NO.	1			
28	MS TOOL BOX	NO.	1			
NOTES						
1	ABOVE IS THE MINIMUM LIST. ANY OTHER TOOL / TACKEL REQUIRED FOR THE SYSTEM SHALL ALSO BE PROVIDED BY THE VENDOR WITHOUT ANY COST IMPLICATION.					
Particulars of bidder / authorised representative						
	Name	Designation	Signature	Date	Company Seal	

PRICE FORMAT REV01				Doc No:	PE-PF-423-553-A001
APPENDIX - B				Rev No:	1
Commissioning spares				Date of issue	NOV 2017
NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP		
NAME OF PACKAGE:			AIR CONDITIONING SYSTEM		
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017		
SL NO	DESCRIPTION	UNIT	Qty	Total Price (Ex-Works/ C&F) duly packed	
1	AHU FAN BELTS	SET	1		
2	PRESSURE GAUGE	NO.	1		
3	TEMPERATURE GAUGE	NO.	1		
4	FILTER	SET	1		
5	COMPRESSOR OIL	Ltr.	1 Lot		
6	REFRIGERANT	Kg	1 Lot		
NOTES					
1	ABOVE IS THE MINIMUM LIST. ANY OTHER COMMISSIONING SPARE REQUIRED FOR THE SYSTEM SHALL ALSO BE PROVIDED BY THE VENDOR WITHOUT ANY COST IMPLICATION.				
Particulars of bidder / authorised representative					
	Name	Designation	Signature	Date	Company Seal

PRICE FORMAT REV01 ANNEXURE-II LIST OF MANDATORY SPARES					
NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP		
NAME OF PACKAGE: AIR CONDITIONING SYSTEM			AIR CONDITIONING SYSTEM		
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017		
S. No.	DESCRIPTION	UNIT	Qty	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
A	C&I portion				
	The quantity of following spares includes a minimum of 20 % spares for replacement of each type of lamps, PBs, ILPBs, fuse, MCB, MCCB used in the equipment/system offered by him even if this is not detailed below.				
i)	Measuring Instruments and Skid Mounted Instruments	Lot	1		
1	10% of the number of indicators, recorders and meters offered from each model for the project or a minimum of one number per model, whichever is more. These instruments shall be supplied with three sets of blank scales.				
2	For skid mounted instruments (if any) - 10% of total number of instruments for each model and type for the project or a minimum of one number for each model and type, whichever is more.				
ii)	Temperature Elements and Thermowells	Lot	1		
1	10% spare thermocouple/RTD elements, suitable for replacement for each type and length of element furnished with thermocouple/RTD assemblies, or a minimum of one number of each type & length, whichever is more.	%	10%		
2	10% thermo wells for each type of temperature sensors or a minimum of one for each type, whichever is more	%	10%		
3	Temperature Transmitters and Electronic Transmitters (For Pressure, DP, Temp, Flow, Level), Temperature, Pressure, Flow & Level Switch, safety switches, Gauges, meters, Transducer or any other instrument etc.				
	10% of total number of instruments/transducers offered for each model and type for the project or a minimum of one number, whichever is more.	Lot	1		
iv)	Distributed Control System and Other Electronic Systems/Sub- Systems/ VMS / MIS /LAN / Simulator / WAN / CAAQMS and any other system as supplied as per Tender Specification etc.	Lot	1		
1	Electronic modules - 10% of number for each type or minimum of 2 number for each type whichever is high.	%	10%		
2	Auto/Manual stations, setpoint/ bias stations etc.:- 10% of the number of stations offered for the project from each type or a minimum of 2 number from each model, whichever is more.				
3	Twenty percent spare replacement for each type of control logic power supply fuses, MCB, MCCB, at each current rating required for the project.	%	20%		
4	Ten (10) percent or 2 no. (Whichever is more) Electronic cards of each type used for Servers supplied with any control system.				
5	10% of electric to pneumatic converters of each type utilized with automatic control system using pneumatic drives or a minimum of one of each type, whichever is more.				
6	Ten (10) percent or five no. (Whichever is more) of cubicle power supply power supply modules of each type and rating.	Nos.	5		

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NAME OF PACKAGE: AIR CONDITIONING SYSTEM			AIR CONDITIONING SYSTEM		
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017		
S. No.	DESCRIPTION	UNIT	Qty	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
7	Ten (10) percent of the total quantity of each type of interposing/coupling relays.	Sets	1		
8	Twenty (20) percent or 2 no. (Whichever is more) RJ 45 connector with box of each type.	Nos.	2		
9	Ten (10) percent or 2 no. (Whichever is more) Hooters, Buzzers, Cooling fans of each type.	%	10%		
10	Interface cables 2 sets of each type/model	Sets	1		
11	Power supply modules (AC to DC convertors) 10% or Five no. (Whichever is more) of each type/model	Nos.	5		
v)	Relay Based Control Panels	Sets	1		
1	10% LEDs for indicating lights shall be furnished.				
2	Three times, the one hundred percent (300% of installed) spare replacement control circuit fuses/MCB/MCCB of each current rating required shall be furnished.				
3	20% spare replacement relays modules & contactors of each type.				
vi)	Alarm Annunciation System	Sets	1		
1	20% spares of each type installed shall be provided for logic modules, group card modules, power supply modules, Hooters and any other electronic module.				
2	5% spares of each size shall be provided for un-engraved window boxes complete with LED etc.				
3	20% of installed LEDs for annunciation facia windows and LEDs box assemblies offered for the project shall be provided as mandatory spares.				
4	One (1) spare annunciator hooter of each type.				
vii)	Erection hardware	Sets	1		
1	Ten (10) percent of each type & Size installed instrument valve, manifold for each type, rating, model number and size of devices supplied for the project.				
2	Ten (10) percent of total number of condensate pots or four numbers whichever is higher of each type & Size installed.				
3	Ten (10) percent of each type & Size installed Fittings				
viii)	Mandatory Spares for Control valves, Power Cylinder, Control Dampers, Actuators and Accessories				
a)	Following spares shall be furnished for control valves, Power Cylinder, Control Dampers as applicable.	Lot	1		
1	One set of spare control valve stem packing for each control valve.				
2	Two moulded rubber diaphragms for each control valve.				
3	One sets of each of O-rings and rubber gaskets for each control valve.				
4	100 percent qty. of lubricants for gaskets for each control valve on one year consumption basis.				
5	2 sets of limit switches and 1 set of valve positioner for each control valve.				
6	20 percent of position transmitter (4-20mA) for total qty. of control valve.				

PRICE FORMAT REV01 ANNEXURE-II LIST OF MANDATORY SPARES					
NAME OF PROJECT:			1x800 TANGEDCO NORTH CHENNAI TPP		
NAME OF PACKAGE: AIR CONDITIONING SYSTEM			AIR CONDITIONING SYSTEM		
TENDER ENQUIRY No:			PE/PG/NC3/E-5784/2017		
S. No.	DESCRIPTION	UNIT	Qty	Unit Price (Ex-Works/C&F Price) duly packed	Total Price (Ex-Works/ C&F) duly packed
7	One (1) set of valve trims (such as plug, stem, seat ring / cage, guide bushing, stem lock pin, packing retaining ring, etc.) for each control valve.				
8	One completes actuator of each type or min 10% for each type and size whichever is more.				
9	20 percent of Solenoid valves or min 2 no. of each type for total qty. of control valves.				
10	20% of I to P converters, Pressure regulators.				
ix)	Mandatory spares not covered above	Lot	1		
	Bidder to supply 10% or 1 no. (whichever is more) of each type of sensor/instrument, analyzers /special instruments/Electronic card, instrumentation/mechanical fittings etc. for any other electronic system, feeder control cabinets, hydra step (EWLI), Vibration Monitoring System, CCTV, C&I Lab Instruments, On line Carbon in Ash analyzer system, On line Coal mass flow/speed measurement system, On line secondary air flow measurement system Mass Flow meter, Solid flow meter, 3 D Acoustic type level transmitters, Nucleonic & non nucleonic density transmitter etc.				
B	Electrical portion				
1	415V Motors				
1.1	Terminal plates	Nos.	10 Nos. each for small motors upto 30 KW & 4 Nos. each for more than 30 KW		
1.2	Heaters	Set	2 sets		
1.3	Greasing arrangements	Set	4 sets each type of motor		
1.4	Motor of each type and rating	Nos.	10% of the installed quantity or minimum 1 number whichever more		
1.5	Bearings (DE and NDE) for each type and rating of motor	Set	4 set		
Note: 1. Mandatory spares listed above is bare minimum requirement. In case any additional mandatory spares requirement is covered elsewhere in the tender specification apart from specified above, same shall be deemed to have been covered in bidders scope of supply. 2. One (1) Set and One (1) set of each type & rating is defined as total numbers as required for one complete replacement for one equipment of similar size & capacity. 3.. "All mandatory spares shall be supplied as per the requirement of the specifications. In case any spare indicated in the specification is not applicable for particular equipment then suitable applicable alternate spare have been offered / shall be supplied without any financial implication." 4.. For quantities indicated in percentage, fractions are to be rounded-off to next higher integer. 5. Any item which is not applicable in the above list and is found to be applicable at a later date shall be supplied by the Vendor without any extra cost.					
Particulars of bidder / authorised representative					
	Name	Designation	Signature	Date	Company Seal

PRICE FORMAT REV01
ANNEXURE - III
Guaranteed Power Consumption For Air Conditioning System

NAME OF PROJECT:		1x800 TANGEDCO NORTH CHENNAI TPP				
NAME OF PACKAGE:		AIR CONDITIONING SYSTEM				
TENDER ENQUIRY No:		PE/PG/NC3/E-5784/2017				
S.NO.	DESCRIPTION OF EQUIPMENT	NO OF EQUIPMENT		TOTAL GUARANTEED POWER CONSUMPTION FOR EACH EQUIPMENT AT MOTOR INPUT TERMINAL AND CONTROL PANEL (IN KW)	DUTY FACTOR	TOTAL KW
		WORKING	STANDBY			
		3A	3B	4	5	6=3Ax4x5
1	AC PLANT FOR COMMON CONTROL ROOM AREAS, CER ROOM, UPS ROOM, COMPUTER ROOM					
1.1	Water chilling machine	1	1			
1.2	Chilled water pumps for AC plant	1	1			
1.3	Condenser water pumps for AC plant	1	1			
1.4	Cooling tower fans for AC plant	1	1			
1.5	AHUs for Common control room areas, CER, computer room etc at EL 24 M.	2	1			
1.6	Fresh air fans for above AHUs room	2	0			
1.7	AHUs for UPS room area at EL 8.5 M.	1	1			
1.8	Fresh air fans for above AHUs room	2	0			
2	ESP					
2.1	Water cooled condensing unit	1	1			
2.2	FRP Cooling Tower	1	1			
2.3	Condenser water pumps	1	1			
2.4	AHU for above condensing unit	1	1			
2.5	Fresh air fans for above AHU room.	2	0			
				TOTAL (KW)		
Note:	Estimated power consumption (EPC) figure for the system (for working drives only) has been considered as 336 KW. So long bidder's quoted guaranteed power consumption (GPC) above remains within this EPC, there will be no technical loading of bid on power consumption for evaluation. However, if bidder's quoted GPC exceeds EPC, there shall be technical loading of bid for evaluation @ Rs 588401/- per KW of additional power over EPC. Bidder's guaranteed power consumption at motor input terminals (not shaft power) as furnished in relevant schedule shall be demonstrated by the successful bidder during performance testing at works/ site. In case power consumption is noted higher than EPC / bidder's quoted GPC whichever is higher, during inspection/ PG test, penalty @ Rs 588401/- per KW shall be levied on vendor.					
Particulars of bidder / authorised representative						
Name	Designation	Signature	DATE	Company Seal		